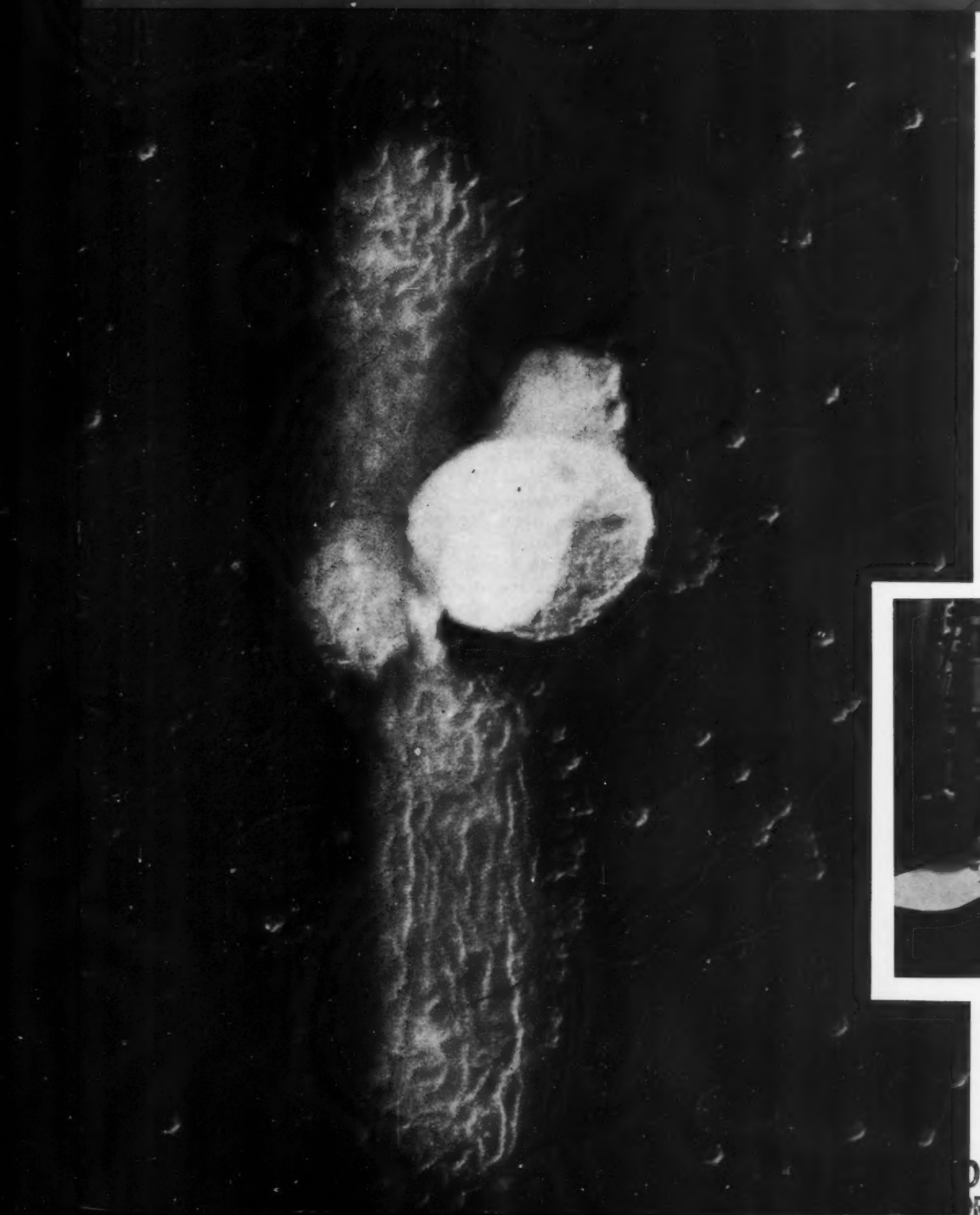
JUNE 1959

Bulletin

NATIONAL TUBERCULOSIS ASSOCIATION



SPECIAL REPORT ON RESEARCH

Through this electron microscope, an investigator at the School of Medicine, University of California at Los Angeles, studies a mycobacterium infected with a phage (left).

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Bulletin

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Are We Meeting Research Needs?

Voluntary health agencies concerned with the prevention and the treatment of disease have for many years accepted the responsibility of supporting research and educational activities as essential parts of their mission. The wisdom of this concept has led to an increased availability of funds for support of research in all medical areas.

There has been a spectacular growth of voluntary health agencies during the past decade, and their public appeal has been, in large measure, related to their research interests and accomplishments. Approximately 25 per cent of the funds raised through public appeal are being used for support of research. During the past decade, some health agencies have spent more than half of their "collections" for research. During this same period, affiliates of the National Tuberculosis Association have made available to the American Trudeau Society one per cent of total Christmas Seal Sale moneys (16 per cent of the NTA budget) for support of research through the national office, and they are said to spend an additional 2 to 3 per cent of their funds for research sponsored at the state or local level.

We must face the fact that we are far from meeting the needs in the field of respiratory diseases, recently accepted as the extension of program responsibility for the NTA and the ATS. At a time when acute and chronic respiratory disorders account for 20 per cent of the national morbidity (restricted-activity days or bed-disability days) and 10 per cent of the national mortality, the Committee on Medical Research still has available only $210,000 to support worthy research grants. This is less than half the amount requested by investigators who apply for support. Equally shameful is the amount of money available for medical education through fellowships – $40,000. If we are to promote a bold program of respiratory disease control, we must have available well-trained physicians with the necessary time to devote to their research.

In my judgment, it is as frustrating to have a program without a budget as it is to have a budget without a program. The NTA and the ATS are now engaged in formulating a program that is geared to meet the medical needs of our country. Such a program perhaps should include viral and bacterial diseases, neoplastic diseases, and degenerative disorders. In fact, it could include the entire spectrum of respiratory diseases, from the common cold to cancer of the lungs.

To make significant contributions in this broad area will require all of the modern tools of physiology, chemistry, pathology, bacteriology, and even of engineering. These tools are expensive, but they are not as valuable as the men who will use them. I am concerned that physicians and scientists interested in research will turn their attention to other medical problems where they can obtain the tools more easily than is now possible through TB associations and the ATS.

If we undertake a broad program in respiratory diseases, we must be prepared to broaden the research and education base. The service function of the organization will not prosper without the research accompaniment. Indeed, Dr. Edward Trudeau's impact and the lasting contributions he made through research and teaching favorably influenced many more persons than the very few he personally treated. A noble heritage will be lost unless we follow the same principles.– **Martin M. Cummings, M.D.,** *Director, Research Service, Veterans Administration*

An aerial view of the National Institutes of Health, Bethesda, Md.

BUDGETING FOR DEFENSE AGAINST DISEASE

The $300 million that Americans spend every year on chewing gum is more than the 1959 Federal appropriation to the National Institutes of Health for all medical research. Such a discrepancy emphasizes the inadequacy of the present program

By Richard L. Neuberger

WHEN I returned to Washington and my Senate duties in February, this year, following my successful treatment for cancer, one of the newspapers which commented editorially on my recovery was an Arizona paper, circulated in a sunny locale to which tuberculosis sufferers have flocked. The editorial writer noted that, in earlier days, the tuberculosis patients had even formed clubs and had a camaraderie among themselves. But, the writer continued, thanks to medical research, great gains have been made in the conquest of the disease, and such groups have lost their fatalistic nature.

My doctors have just given me a clean bill of health after operation and treatment for a disease whose cured victims are organizing "victory" clubs. Like thousands of tuberculosis sufferers, we owe our lives to the advances of modern medicine; we are living symbols of the results of medical research.

The debts that all Americans owe to medical research are many. Human happiness and decreased suffering is one. The five years that have been added to the average life-span in the last decade, resulting in added productive strength for our nation, is another.

Indeed, were it not for the medical research of the last quarter century, about all our doctors would have in their familiar black bags would be bottles of aspirin and stethoscopes. The amazing vaccines and antibiotics that today we take for granted in the treatment of everything from the common cold to the most complex infectious disease are results of the research during this brief period.

Yet the investment which has purchased these benefits is trifling when compared with the amounts Ameri-

cans spend on such items as chewing gum, permanent waves, and tobacco.

In fiscal year 1959, for example, a little more than $34.2 million was appropriated from Federal sources for heart disease research. Americans spend eleven times that amount each year on permanent waves!

Under the leadership of Senator Lister Hill, of Alabama, I have worked in the Senate to increase the Federal appropriations to the National Institutes of Health for all medical research. We have succeeded in some measure. The appropriation for fiscal year 1956 was $98,458,000; the 1959 figure was $294,383,000. But compare either of those totals with the more than $300 million that we spend annually on chewing gum.

Cannot an economy that includes annual expenditures of $6 billion for research on missiles and armaments spare more than a pittance for research into the saving of human life?

More Research Funds Justified

Fifty million Americans now living will die of cancer, but the Federal Government devotes fifty times as much to farm price supports as it does to cancer research. With a background of such staggering statistics, I believe greater Federal appropriations for medical research—such as my proposal for an additional $500 million for cancer research through the National Cancer Institute—are not only thoroughly justified but urgently needed.

The argument for increased funds follows the three principles which must guide all effective medical research. Larger research appropriations would:

1. Insure continuity and stability in medical research. Our able researchers would be assured that their salaries were no longer based on the uncertainties of annual Congressional approval. Thus these people could avoid the inevitable temptation of abandoning laboratories for the greater financial rewards of private medical practice.

2. Permit expansion of basic as well as applied research. Military science and technology are not the only fields which have benefited greatly from basic research. Fundamental studies originally thought only distantly related to patient treatment have resulted in important forward steps in medicine.

3. Recognize that medical research cannot move forward by any arbitrary schedule, and that researchers must be free from financial limitations that cramp the ingenuity of the mind.

Medical Researchers Needed

Research—be it basic or specialized—requires researchers. Provision of necessary funds for research programs is nothing without trained minds to utilize them. Yet the rigors of obtaining a medical education are great, especially financially. The newly graduated M.D. and his family too often have heavy debt loads. Many of these students find their economic position so precarious that they feel forced to employ their skills in private practice, where monetary rewards are, of course, greatest.

I have introduced legislation in Congress which, if enacted, can assist in supplying the trained medical researchers we need. My bill would amend the loan fund program of the National Defense Education Act, which Congress passed last year, to give medical researchers benefits now enjoyed by elementary- and secondary-school teachers. That is, loan recipients who enter medical research would be permitted to write off up to 50 per cent of their loan and interest under the Defense Education Act.

I recognize that my proposal is not a panacea for all the ills of our medical research personnel problem. We are still faced with inadequacies in the facilities and finances of our medical schools. And medical research itself does not possess the natural glamour or remunerative appeal of private medical practice.

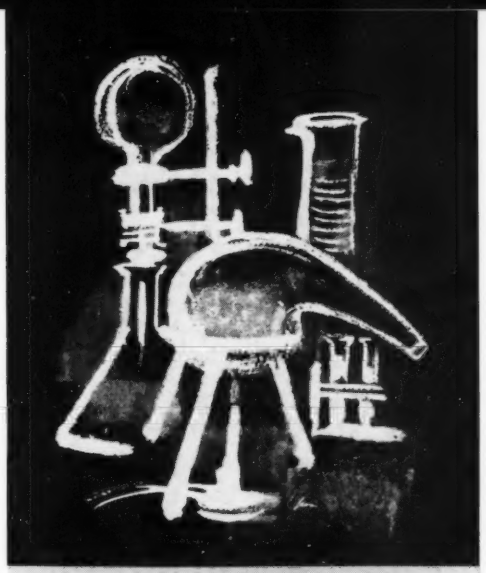
There is no questioning its significance, however. Medical research has touched the very life of all of us. In little more than a decade, its products have cut the fatality rate of once dread diseases like influenza and rheumatic fever by as much as 83 per cent. I write and speak and vote in the Senate today as a personal testimony to medical research.

Our Federal budget includes unquestioned billions for the defense of the American people against potential foreign enemies. We can and must afford more for the defense of our people against disease—through investment in medical research.

Mr. Neuberger has been United States Senator from Oregon since 1954. Formerly he had served in the Oregon State Senate. Prior to entering politics, Mr. Neuberger was a free-lance writer on subjects ranging from the history of the Pacific Northwest to railroading. He is also the author of numerous articles on medical education and research. Since his election to the U.S. Senate, Mr. Neuberger has been active in the cause of increased Federal appropriations for medical research. His article was solicited by the Governing Council of the National Conference of Tuberculosis Workers.

NTA ANNUAL MEETING

At the Annual Meeting of the National Tuberculosis Association, held in Chicago, Ill., May 24-29, H. McLeod Riggins, M.D., took office as president of the NTA, Roger S. Mitchell, M.D., took office as president of the American Trudeau Society, and Alfred E. Kessler took office as president of the National Conference of Tuberculosis Workers. A report of the meeting will appear in the July *Bulletin*.



THE SEARCH CONTINUES

Forty-five investigators will seek answers to a wide variety of questions about TB and other respiratory diseases this coming year under grants from the NTA-ATS

By Agnes Fahy

Science Writer, National Tuberculosis Association

THE Committee on Medical Research of the American Trudeau Society, meeting in New York City March 5 and 6, reviewed 68 applications submitted to the National Tuberculosis Association-ATS for medical research grants from Christmas Seal funds. Forty-seven of the grants were approved by the committee. Two were later taken over by the New York Tuberculosis and Health Association.

Thus, 45 applications stand approved, and grants will be made to the investigators as funds are available. The presently available funds will cover 33 of the applications, for a total of $257,208. (This includes $500 to the National Society for Medical Research, an annual contribution.)

As in past years, a number of constituent and affiliated associations have indicated their intention of contributing additional funds to the research program. As these funds are received, grants will be made to additional investigators. If a special contribution is earmarked for a grant that has already been activated, it will be applied as the donor requests, and the funds already appropriated will be released for other grants.

The approved applications consist of 32 renewals and 13 new ones.

A brief sketch of each application approved follows. The grants already covered by available funds are listed first. An asterisk indicates a new grant. The word or words in parentheses after the investigator's name indicate the broad field of the research.

***Thomas Tarcisio Amatruda, Jr., M.D., Medical and Metabolism Services, Veterans Administration Hospital, West Haven, Conn.** (hormones in TB) Dr. Amatruda proposes to investigate whether or not the use of steroids and ACTH, together with antimicrobial drugs, in the treatment of tuberculosis has an adverse effect on the hypothalamic-pituitary-adrenal system. This is important because steroids are being used more widely in the treatment of some types of tuberculosis.

Edward N. Azarowics, Ph.D., Johns Hopkins Hospital, Baltimore, Md. (phage typing) The classification of an entire genus of microorganisms known as *Nocardia* is being undertaken by Dr. Azarowics. Nocardia are a branch of the actinomyces family of fungi, and certain of the species are found in chronic lung conditions. The classification is being made by means of phages, the viruses active on certain species only. The phages are found in "lysogenic" nocardia and mycobacteria strains and must be isolated before they can be tested for specificity. Lysogenic strains are ones in which a phage is present, but detectable only under certain cultural conditions.

Morgan Berthrong, M.D., Glockner-Penrose Hospital, Colorado Springs, Colo. (immunology—tissue culture) A debatable question is whether the cells of the blood play an important role in immunity to tuberculosis. Using a technique known as tissue culture—tubercle bacilli are ingested by and grow within animal cells suspended in test tubes—Dr. Berthrong has reported that tubercle bacilli grow more profusely in cells from normal animals than in cells from animals made immune to tuberculosis. He plans to find out whether the administration of cortisone to the animals from which the cells are obtained has any affect on lowering (or enhancing) immunity, since cortisone has been shown to alter resistance in patients.

Abraham I. Braude, M.D., University of Pittsburgh School of Medicine, Pittsburgh, Pa. (fever production) A study of how fever is produced in infections in the lung caused by bacteria and fungi is being undertaken by Dr. Braude. He will search for the fever-producing factor in the infectious agents and seek to find out how the pyrogenic substance is released. The study is expected to contribute to the understanding of the general mechanism of how fever is caused.

Leon R. Cole, M.D., University of Southern California School of Medicine, Los Angeles, Calif. (immunity) Methods of transferring antibodies from animals with tuberculosis to normal animals are under study by Dr. Cole. The investigator has devised a method of injecting fractions of blood plasma containing antibodies that cause a reaction to PPD in other animals and has been working on a clinical test for specific tuberculosis antibodies in patients.

Max S. Dunn, Ph.D., University of California, Los Angeles, Calif. (chemistry of tubercle bacillus) In a study of the chemistry of the tubercle bacillus, Dr. Dunn is interested in the metabolic products of mycobacteria and the influence of amino acids on the growth and metabolism of mycobacteria. In connection with the first phase of the study, Dr. Dunn hopes to find out whether some of the metabolic processes of mycobacteria are unique to them, and especially to virulent strains. As for the second part of the study, Dr. Dunn has postulated that the low growth rates of mycobacteria in media containing some amino acids may be related to an antagonistic effect on the amino acid metabolism of the mycobacterium. If the antagonistic effects of certain amino acid derivatives are sufficiently strong, they may be useful as therapeutic agents.

Seymour Froman, Ph.D., Olive View Sanatorium, Olive View, Calif. (phage typing) By means of bacteriophages, Dr. Froman is attempting to type various strains of acid-fast bacilli, including the tubercle bacillus. Phages are viruses that have an affinity for specific strains of bacteria and thus can be used to identify the strains. Dr. Froman hopes to find bacteriophages which will permit differentiation of types among the mammalian tubercle bacilli. He also plans to type tubercle bacillus strains obtained from all parts of the world, and to develop and standardize phage typing to the point where it can be used as a practical procedure in epidemiological studies.

John W. Irwin, M.D., Massachusetts Eye and Ear Infirmary, Boston, Mass. (pulmonary circulation) Dr. Irwin is developing techniques to expedite the study of the smallest blood vessels of the lung—the arterioles—which can be seen only under a microscope. He has succeeded in recording the blood pressure in these tiny vessels in rabbits, under varying conditions. These studies are revealing data of help in understanding changes that occur in illness.

Harold L. Israel, M.D., Graduate School of Medicine, University of Pennsylvania, Philadelphia, Pa. (sarcoidosis) Little is known about the origin of sarcoidosis, a disease which may cause lesions in the lung and usually on the skin. Dr. Israel is engaged in epidemiological studies of sarcoidosis with a relatively large group of patients. He plans this year to study in particular the possible relationship between sarcoidosis and pine pollen, following up studies reported by Martin Cummings, M.D., et al.

Julia M. Jones, M.D., Chest Service, Bellevue Hospital, New York, N.Y. (extrapulmonary tuberculosis) A study of the treatment of extrapulmonary tuberculosis among patients seen at Bellevue Hospital is being undertaken by Dr. Jones. The types of tuberculosis included in the study are tuberculous pleurisy with effusion, tuberculosis of the lymph nodes, tuberculous pericarditis (the heart sac), tuberculous salpingitis (Fallopian tube), tuberculosis of the bone, and of the genitourinary tract. Some of these forms of tuberculosis are seen only infrequently and there is little information on the long-term results of treatment, even though immediate results may be satisfactory. Dr. Jones's study is expected to make valuable contributions to the understanding of the care of patients with extrapulmonary tuberculosis.

Edith M. Lincoln, M.D., New York University-Bellevue Medical Center, New York, N.Y. (childhood tuberculosis) Prior to the chemotherapy era, Dr. Lincoln began a long-term observation of children with primary tuberculosis observed at Bellevue Hopital in New York City. The purpose was to study the natural course of the

disease and to find out what the aftereffects of early tuberculosis in children were. Between 1930 and 1940, 1,000 cases had been brought into the study, and valuable information had been obtained, such as the fact that the period of adolescence was the danger point in regard to reactivation. Early in the period when drugs were used, Dr. Lincoln started another study to learn what the effect of specific therapy was on the prognosis of the disease. She is continuing the follow-up of the two groups and hopes to have her data completed within a year.

James B. Littlefield, M.D., Department of Surgery, University of Virginia School of Medicine, Charlottesville, Va. (pulmonary circulation) An American Trudeau Society research fellow, Dr. Littlefield is studying the collateral pulmonary circulation to find out whether this "secondary" system of small vessels can be expanded to take care of emergencies arising from certain types of coronary artery disease. In surgery on animals, he plans to ligate, or tie off, a branch of the pulmonary artery in an attempt to divert more of the oxygenated blood from the lung through the collateral blood vessels into the coronary artery and thus prevent the supply of blood from being completely shut off.

Max B. Lurie, M.D., The Henry Phipps Institute, University of Pennsylvania, Philadelphia. (immunity) In a long-range study of native resistance and susceptibility to tuberculosis, Dr. Lurie has observed that hormones in the body have a definite role in resistance to infectious disease. He has continued to pursue this line of study and at present is investigating the role of the thyroid hormones in this connection. In rabbits bred for resistance or susceptibility, he has found that an excess of thyroid hormones will markedly increase resistance, whereas a suppression of these hormones will increase susceptibility. How these hormones bring about the observed effect will be under study during the coming year, and will help explain, as Dr. Lurie puts it, how man "overcomes or slowly succumbs to a chronic infection."

Florence MacInnis, M.D., Heart of America Tuberculosis Association, Kansas City, Mo. (tuberculin testing) A study on the tuberculin test as a case-finding tool carried on in the schools of Kansas City, Mo., under the direction of the late Lawrence E. Wood, M.D., is being continued under the direction of Dr. MacInnis. The purpose of the study is to determine the efficiency of the tuberculin test as a method of finding tuberculosis among school children of various age groups, the rate of infection, and the amount of tuberculosis among the contacts of the children.

Walsh McDermott, M.D., and Robert M. McCune, M.D., Cornell University Medical College, New York, N.Y. (host-parasite relations) This team is studying the relationship between the parasite (tubercle bacillus) and the animal in which it takes up residence. One phase of the study is directed at gaining a better understanding than now exists of the phenomenon of microbial persistence in tuberculosis. This is the situation in which tubercle bacilli susceptible to a drug survive in the body despite continued therapy with the drug. Another phase of the study is directed at the question of whether isoniazid can be given too early after tuberculin sensitivity has developed—that is, whether an animal, or person, with a tuberculin reaction has developed resistance to tuberculosis to the fullest extent or whether resistance continues to increase. In experiments with mice, the investigators have found that immunity produced by a small primary infection was no greater at 16 weeks than at 8 weeks after infection, and that the degree of immunity was not reduced by the administration of isoniazid for a period of from 8 to 14 weeks. This question will be studied further in the year in the hope of determining whether, indeed, isoniazid can be given too soon after infection.

Gardner Middlebrook, M.D., National Jewish Hospital at Denver, Denver, Colo. (immunity) Vaccination against tuberculosis with BCG is usually by inoculation, but infection with tubercle bacilli is usually by the respiratory tract. Dr. Middlebrook has immunized guinea pigs by inhalation, using a special apparatus which permits infection by the airborne route with measured amounts of bacilli. Not only is immunity greater by this method than by inoculation, according to Dr. Middlebrook, but the value of the tuberculin test is not destroyed, since the reaction following immunization by inhalation is different

Left: Max B. Lurie, M.D., is using rabbits to study the role of hormones in resistance to TB. *Right:* "Graduation from TB" ceremonies are held at the NTA to mark the discharge of a Korean War veteran from a long-range TB research study conducted by Edith M. Lincoln, M.D. Here, left to right, are Dr. Lincoln, Floyd Feldmann, M.D., "graduate" Joseph Olivera, Mrs. Olivera, and their son Michael.

from the reaction to natural infection. Dr. Middlebrook now proposes to study this method of immunization in other animal species and perhaps in human volunteers.

William F. Miller, M.D., University of Texas Southwestern Medical School, Dallas, Tex. (pulmonary function) A study of the relationship between the mechanical work of breathing, the force of breathing, and the cost of breathing in energy is proposed by Dr. Miller, who will make a comparison of these factors in healthy persons and people with lung disease. Through his studies, Dr. Miller hopes to contribute to a definition of the efficiency of the respiratory process.

Sidney Raffel, M.D., Department of Medical Microbiology, Stanford University School of Medicine, Stanford, Calif. (immunity and allergy) In a series of studies, Dr. Raffel has found that an extract of the tubercle bacillus, rich in protein, when used in combination with a fatty component of the germ induces immunity to the bacillus in animals. This combination of fractions will be studied further in an effort to learn more about their role in immunity. Dr. Raffel has also found a factor in infected or vaccinated guinea pigs that stops the multiplication of tubercle bacilli. This factor, not yet clearly understood, requires calcium for its activity and remains active even if the guinea pig is subjected to irradiation, a process that ordinarily destroys immunity. A further study of the factor, including a search for it in blood serum from tuberculosis patients, is planned.

Oscar K. Reiss, Ph.D., University of Colorado School of Medicine, Denver, Colo. (isoniazid metabolism) In collaboration with J. Carroll Bell, M.D., and Roger S. Mitchell, M.D., Dr. Reiss will conduct studies on the metabolism and pharmacology of isoniazid and other tuberculosis drugs at the Colorado Foundation for Research in Tuberculosis. The studies are expected to increase understanding of the relative merits of high- and low-dosage isoniazid among rapid and slow inactivators of isoniazid.

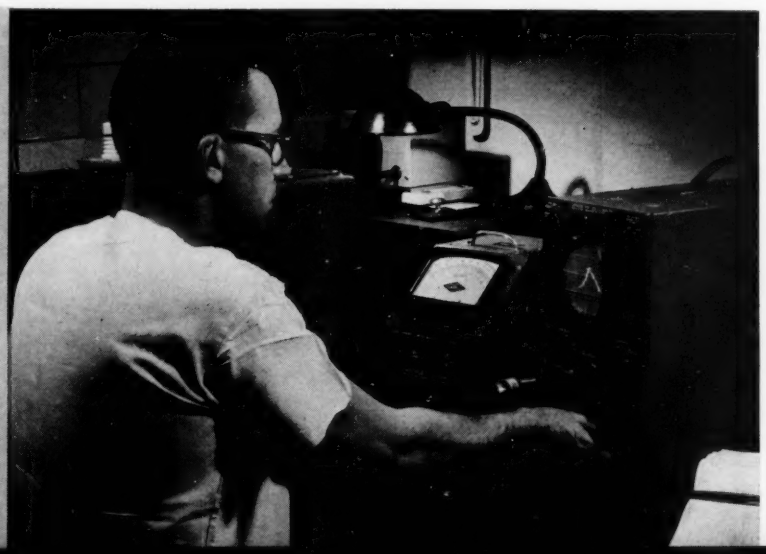
Lloyd J. Roth, M.D., University of Chicago, Chicago, Ill. (isoniazid metabolism) Due to a chemical action known as acetylation, some patients break isoniazid down quickly and derive less benefit from it than those who do not, and eventually excrete it in whole, or "free," form. The theory has been propounded that one advantage in the use of PAS (para-aminosalicylic acid) with isoniazid is that it interferes with the acetylation of isoniazid. Dr. Roth plans to measure the acetylated isoniazid in the urine of patients to determine whether acetylation of isoniazid is slowed down by PAS. Radioisotopes and ion exchange resins will be used in the studies.

Ernest H. Runyon, Ph.D., Veterans Administration Hospital, Salt Lake City, Utah. (atypical bacilli) A culture bank for atypical mycobacteria is being built up and maintained by Dr. Runyon. The bank will make possible a source of cultures and of pertinent data for use in teaching, for reference in clinical and diagnostic laboratories, and for research dealing with acid-fast organisms similar to, but distinct from, bovine and human strains of tubercle bacilli.

Leon H. Schmidt, Ph.D., The Christ Hospital Institute of Medical Research, Cincinnati, Ohio. (drug action) With the rhesus monkey as his tool, Dr. Schmidt is testing the efficacy of various drugs and drug combinations used in tuberculosis treatment. As a preliminary measure, Dr. Schmidt had to find a way to produce a chronic type of tuberculosis similar to the slowly progressive, cavitary disease of man instead of the acute, rapidly spreading tuberculosis characteristic of the disease in the monkey. He has succeeded in doing this by two different methods —by vaccinating the monkey with BCG prior to infection with virulent tubercle and by treating established disease with a relatively weak drug (PAS or thiocarbanidin). Dr. Schmidt plans this year to evaluate the two methods to find out which is the more satisfactory, then to test presently available drugs in various combinations. He will also be prepared to study the effectiveness of any new drugs that may be discovered.

Arthur A. Siebens, M.D., University of Wisconsin School of Medicine, Madison, Wis. (pulmonary physiology) In studies with animals, Dr. Siebens is seeking to determine whether the removal of a lung early in life will be compensated for by greater development of the re-

A new analytic instrument—the spectrophotofluorometer—makes it possible to measure as little as 1/10,000,000th gram of isoniazid in blood. The procedure, developed by John H. Peters, Ph.D., is being used to measure the amount of drugs in the blood at varying periods after administration, in studies carried on under Leon H. Schmidt, Ph.D.



maining lung than would normally occur. Preliminary studies indicate that full compensation is not effected, and further study is indicated before the question can be answered satisfactorily.

Donald W. Smith, Ph.D., Department of Medical Microbiology, University of Wisconsin, Madison. (chemistry of mycobacteria) Through a study of the lipids (fats and waxes) of various members of the mycobacteria family, Dr. Smith hopes to be able to identify the various strains. If a particular lipid is found to be peculiar to a certain strain, and only to that strain, it will be possible to employ chemical analysis to differentiate between the various strains of atypical bacilli resembling the tubercle bacillus.

William Steenken, Jr., D.Sc., Trudeau Laboratory, Saranac Lake, N.Y. (microbiology) Through the grant to Dr. Steenken, the NTA-ATS performs a service to investigators engaged in tuberculosis research the world over. Dr. Steenken maintains a culture bank of tubercle bacilli and other mycobacteria of a wide variety of strains—human strains, bovine strains, and avian strains; some virulent, some nonvirulent; strains resistant to drugs commonly used in treating tuberculosis, some susceptible to these drugs. Since it is important for investigators to know with exactly what strain they are working when they begin an experiment, they write Dr. Steenken for the strain with the desired characteristics. Last year Dr. Steenken sent 200 cultures to 65 investigators in this country and abroad.

Myron Stein, M.D., and Herrman L. Blumgart, M.D., Beth Israel Hospital, Boston, Mass. (pulmonary function) These two investigators are seeking information on whether changes in the thyroid state have an effect on pulmonary function. The studies are expected to help clarify the effect of lowering thyroid activity in treating patients with cardiac and pulmonary disease.

Allan Stranahan, M.D., Albany Medical College, Albany, N.Y. (pulmonary function) A 10-year follow-up of patients who have had an entire lobe or a whole lung removed is being made by Dr. Stranahan. Pulmonary function tests will be given the former patients to determine to what extent the functioning of the lung has been reduced by the operation.

***Richard A. Tjalma, D.V.M., State University of Iowa College of Medicine, Iowa City, Iowa.** (blood test) Dr. Tjalma proposes to use the serological test developed by Drs. Youmans and Parlett on the sera of cattle. He hopes to be able to determine whether, in the event a cow reacts to the tuberculin test, the infection was due to exposure to a human being or to another cow. At the same time, the study is expected to reveal whether persons in contact with tuberculin positive cattle become tuberculin sensitive because of that contact. If the serological test is helpful in finding the answers to these questions, Dr. Tjalma believes that "a most efficient method of determining active tuberculosis" in man and in cattle will be available. The study will be carried out in cooperation with the U.S. Department of Agriculture and also, in part, in cooperation with the Iowa Department of Agriculture.

John M. Tyler, M.D., Lemuel Shattuck Hospital, Boston, Mass. (pulmonary function) The treatment of patients with emphysema is under study by Dr. Tyler. Patients with this lung condition suffer from severe shortness of breath and difficulty in breathing. Mechanical devices are available that offer temporary relief. Dr. Tyler is testing a new type of respirator that keeps time with the patient's breathing and is known as a patient-cycled respirator, which, he believes, may help the patient over periods of acute illness when mechanical assistance may be a question of life or death.

Hilda Pope Willett, Ph.D., Duke University Medical Center, Durham, N. C. (mycobacteria) Dr. Willett has been studying the metabolism of the tubercle bacillus on the theory that interference with its metabolism might lead to disastrous results to the microorganism. However, the attack must be planned in such a way that no harm is done the host. Thus, she reasons, an enzyme reaction necessary to the bacillus but not found in the host might be a strategic point of attack. She plans during the year to investigate the role of an amino acid enzyme known as DAP (diaminopimelic acid) decarboxylase on the meta-

Because some patients break down isoniazid quickly and may get less benefit from it than those who do not, Lloyd J. Roth, M.D., is trying to find out if another drug—PAS—can slow this process.

bolic processes of the bacillus and to find out to what extent isoniazid interferes with its reaction.

H. Stuart Willis, M.D., North Carolina Sanatorium System, Chapel Hill, N. C. (immunity) Studies on vaccination against tuberculosis are under way by Dr. Willis, with the assistance of H. Mac Vandiviere. The investigators are making a comparative study of various vaccines made from strains of BCG and of R_1. The latter is an avirulent human strain. A vaccine made from it has been tested successfully by Dr. Willis in a large number of animals. The investigators are also seeking a dependable, efficient method of preserving vaccines so that stability will be retained during storage. An additional project is a comparative study of antigens used in skin testing to determine what fractions of the tubercle bacilli and of atypical bacilli may be the most satisfactory for tuberculin tests.

George W. Wright, M.D., Department of Medical Research, St. Luke's Hospital, Cleveland, Ohio. (3-D lung) The reconstruction of sections of the lung in three dimensions is being undertaken by Dr. Wright. The reconstruction is being done with specially treated tissue removed surgically from patients who have had obstructive emphysema. The model is expected to be of help in studying this lung disease.

Guy P. Youmans, M.D., Northwestern University Medical School, Chicago, Ill. (blood test) The evaluation of the gel diffusion test for the detection of tuberculosis developed last year by Dr. Youmans and his associate, R. C. Parlett, M.D., is being continued. The technique consists of putting the antigen (a product of the tubercle bacillus) into an agar substance that gels in the small test tube. After it has solidified, another layer of clear agar is pipetted into the tube and allowed to jell, then the tube is filled with blood serum from the patient. If the patient has tuberculosis, the theory is that antibodies from the serum will work down until they meet the antigen, which has worked up from the first substance. When the two meet, a cloudy ring is formed in the agar. If precipitation does not occur, the assumption is that there were no antibodies and no tuberculosis. Whether the test can be accepted as an accurate method of detecting active tuberculosis cannot be determined until it has been used on large numbers of patients and the findings have been carefully analyzed.

Grants for Which Funds Are Not Available

***Leonard B. Berman, M.D., Kidney Research Laboratory, George Medical Division, District of Columbia General Hospital, Washington, D.C.** (clinical) A study would be made of tissue changes in the kidney (glomerulonephritis) in patients with tuberculosis. In preliminary studies, these changes were found oftener than expected. Dr. Berman also proposes to study the effects of antituberculosis drugs on kidney function.

***John S. Chapman, M.D., The University of Texas Southwestern Medical School, Dallas, Tex.** (TB in children) Involvement of the lymph nodes is common in tuberculosis in children, but there is no conclusive evidence to indicate whether or not the hormones are of value in treatment. Therefore, the Committee on Tuberculosis in Children of the American Trudeau Society has outlined a cooperative study to determine the effects of cortico-steroids on tuberculosis of the bronchial and tracheobronchial lymph nodes. The application for the grant for necessary expenses in connection with the study has been made by Dr. Chapman. Cooperating in the study would be Dr. Margaret H. D. Smith, of Bellevue Hospital, New York, N. Y., chairman of the ATS committee; Dr. Katherine Hsu, Baylor Medical School, Houston, Tex.; Dr. Edna Jones, Mayberry Sanatorium, Northville, Mich.; and Dr. Edwin L. Kendig, of Richmond, Va.

***Alfred J. Crowle, Ph.D., Colorado Foundation for Research in Tuberculosis, Denver, Colo.** (serological test) A serological test for determining antibody-antigen reaction that appears to be specific for species and perhaps for strains of mycobacteria has been developed by Dr. Crowle. Through the proposed studies, Dr. Crowle hopes not only to identify precipitating antigens of selected strains, but also to classify the antigens chemically, and to obtain additional data that will be helpful in classifying mycobacteria by their antigenic properties.

***Lydia B. Edwards, M.D., Tuberculosis Program, Division of Special Health Services, U. S. Public Health Service, Washington, D.C.** (tuberculin testing) Tuberculin-testing programs among population groups in various parts of the country will be undertaken in this study to determine the specificity of the test in identifying persons infected by the tubercle bacillus as distinct from other acid-fast organisms. The study is expected to bring to light information that will be valuable in planning steps to prevent the development of disease among those already infected with tuberculosis. Among the groups cooperating in the study are the Tuberculosis Section of the Navy Department, state and local health departments, local tuberculosis associations, school health groups, and tuberculosis hospitals.

***Seymour Froman, Ph.D., Olive View Sanatorium, Olive View, Calif.** (phage) Time-lapse photography will be used by Dr. Froman in studying two phenomena that have been of increasing interest to the microbiologist in recent years. Dr. Froman hopes to find out what effect phage infection has on the morphological characteristics of acid-fast bacilli. Phages are the viruslike particles which attach themselves to specific strains of bacteria and which Dr. Froman is using in another study to classify bacilli. The investigator is studying not only changes that phages bring about in the tubercle bacillus, but also in atypical bacilli resembling the tuberculosis germ. The time-lapse pictures will be, first, of the normal growth of the bacilli, then of the bacilli exposed to phage. Through these studies Dr. Froman hopes to extend

present knowledge of the structure and intracellular organization of the bacilli.

***H. William Harris, M.D., Medical Service, Veterans Administration Hospital, Salt Lake City, Utah.** (genetics) The continuation and broadening of studies which have suggested that genetic factors may have a bearing on isoniazid metabolism is proposed by Dr. Harris. The investigator has already reported that Japanese patients tend to inactivate isoniazid more rapidly than Caucasians do. This is of practical importance because rapid inactivators can not only tolerate, but may need, larger doses of isoniazid than patients who are slow inactivators. Dr. Harris plans to extend the study to include the Chinese, American Indian, Spanish-American, and Negro races.

***Douglas C. Heiner, M.D., University of Arkansas Medical Center, Little Rock, Ark.** (blood test) The techniques employed by Drs. Youmans and Parlett in their serological test will be used by Dr. Heiner in testing sera from patients known to have tuberculosis and other patients suspected of having tuberculosis and still others with nontuberculous diseases. The study would be of value in determining the clinical usefulness of the method in differential diagnosis of bacterial and mycotic lung diseases.

***Stanley Marcus, Ph.D., and Gilbert A. Hill, Ph.D., Latter Day Saints Hospital, Salt Lake City, Utah.** (immunity) This team proposes to study the mechanisms of resistance to such fungous diseases as histoplasmosis and coccidioidomycosis, about which little is known. The investigators have devised a method of immunizing mice against histoplasmosis and have found that such immunization does enhance resistance. They hope to determine the relative significance of body fluids and cells in resistance to mycotic, or fungous, infection.

Carroll J. Martin, M.D., Cardiopulmonary Laboratory, Firland Sanatorium, Seattle, Wash. (pulmonary physiology) Dr. Martin is making a study of the ventilation of different lobes of the lung. The data obtained is expected to be of particular value in gaining a better understanding than now exists of the difficulties in breathing experienced by patients with emphysema. Emphysema is a condition in which air seems to get "caught" and cannot be expired readily.

***Roger S. Mitchell, M.D., Colorado Foundation for Research in Tuberculosis, Denver, Colo.** (emphysema) Emphysema, a lung disease of unknown origin which is an increasing cause of disability and death in older men, is to be studied in its clinical, physiological, and pathological aspects by Dr. Mitchell and associates. By long-term follow-up of patients, Dr. Mitchell hopes to establish the nature and extent of changes in lung tissue in emphysema, to correlate physiological data with the lesions found, and to obtain other information that will be helpful in understanding the course of the disease.

***David T. Smith, M.D., Duke University, Durham, N.C.** (tuberculin testing) A five-year tuberculin-testing program designed to cover every resident of a county (Pamlico County, N.C.) who is at least one year old is under way in this study. Begun in 1956, the program calls for the periodic retesting of the residents. The purpose of the study is to determine the prevalence of tuberculosis, the conversion rate from negative to positive and from positive to active disease, and to find unknown cases of tuberculosis through follow-up and diagnostic examinations of contacts of reactors. The tests are being given by a U. S. Public Health Service team. The work is being coordinated by a state committee, and the grant would supplement local funds.

***William S. Spicer, Jr., M.D., Section for Pulmonary Diseases, University of Maryland School of Medicine, Baltimore, Md.** (pulmonary function) An Edward Livingston Trudeau fellow, Dr. Spicer is planning to study blood flow and volume in the pulmonary capillaries. Through a comparison of these factors in different parts of the lung, the information obtained will be helpful in interpreting the effect of disease on that part of the lung.

One of the most promising tests for the detection of TB—the blood test developed by Guy P. Youmans, M.D., and R. C. Parlett, M.D.—is being studied further this year on a large number of patients to better determine its effectiveness.

SCIENTISTS AT WORK

THE complexion of the committee that acts on applications for medical research grants received by the National Tuberculosis Association - American Trudeau Society reflects the broad interests of the applicants. Furthermore, most of the committee members are engaged in medical research themselves and are familiar with the problems the investigator must face—from the preparation of a budget to the acquisition of hamsters.

Martin M. Cummings, M.D., chief of research of the Veterans Administration, was chairman of the Committee on Medical Research which acted on the grants for the coming fiscal year and presided at the March meeting. Dr. Cummings has a special interest in microbiology and spends what time he can spare from administrative duties in the laboratory. Although a young man, he has had wide experience and has served both the U.S. Public Health Service and the VA in a research capacity. He has recently received renown for cooperative studies under his direction on a possible relationship between pine trees and the incidence of sarcoidosis.

Other members of the committee were:

Hollis Boren, M.D., physiologist, chief, Pulmonary Function Laboratory, Veterans Administration Hospital in Houston, Tex.

Nicholas D'Esopo, M.D., a clinician who is in charge of the pulmonary disease service of the Veterans Administration Hospital, West Haven, Conn. Dr. D'Esopo, formerly with the VA Hospital at Sunmount, N. Y., was one of the first doctors to try a modified bed-rest regimen with patients on chemotherapy.

Giles F. Filley, M.D., clinical physiologist with the Colorado Foundation for Research in Tuberculosis, is affiliated with the University of Colorado Medical School at Denver as assistant professor of medicine. Formerly with the Trudeau Foundation, in Saranac Lake, N. Y., Dr. Filley was in the vanguard of physicians making a special study of pulmonary function. He is now particularly interested in emphysema and the problems of patients suffering from this chronic lung condition.

Gladys L. Hobby, Ph.D., microbiologist for many years with the Research Division of Chas. Pfizer & Co., Inc. Dr. Hobby has recently been appointed to the Veterans Administration Research Division as project director of the Special Microbiological Research Laboratory in East Orange, N. J.

Health authorities from all over the world will report on significant new programs at the 87th annual meeting of the American Public Health Association in the Atlantic City Convention Hall, October 19-23. Sessions will emphasize both practical community applications of recent scientific developments and a review of the scientific bases for public health work. More than 4,000 public health specialists serving in government and voluntary agencies, industrial health work, and private practice are expected to attend.

Clayton G. Loosli, M.D., dean of the School of Medicine, University of Southern California, Los Angeles. Dr. Loosli has broad interests in lung anatomy, epidemiology, and treatment of respiratory diseases, and administrative aspects of preventive medicine. He was formerly professor of preventive medicine at the University of Chicago School of Medicine.

Sidney Raffel, M.D., who for many years has been engaged in studies of immunity and allergy in tuberculosis, heads the Department of Microbiology at Stanford University School of Medicine, Stanford, Calif. Dr. Raffel has been at Stanford, where he obtained his medical degree, since 1935 except for a year of study in Europe as a Guggenheim fellow.

Philip E. Startwell, M.D., an epidemiologist and professor at the Johns Hopkins University School of Hygiene and Public Health, has long been interested in TB, along with all aspects of the epidemiology of disease.

Leon H. Schmidt, Ph.D., a pharmacologist by training and an expert on tuberculosis and other infectious diseases in the rhesus monkey by experience, is director of the Institute of Medical Research of the Christ Hospital, Cincinnati. Dr. Schmidt was an ex-officio member of the committee as chairman of its Laboratory Subcommittee.

James A. Wier, M.D., a colonel in the Medical Corps of the Army, is stationed at Fitzsimons Army Hospital, Denver, where he is in charge of the Pulmonary Disease Section. A clinician, Dr. Wier was chairman of the ATS Committee on Therapy and an ex-officio member of the research committee.

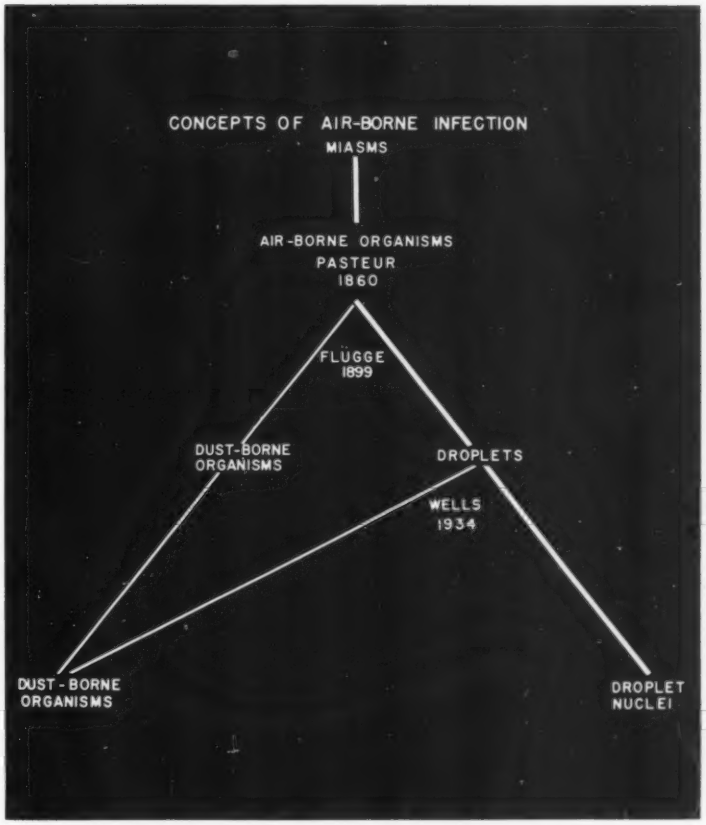
Harry Walkup, M.D., thoracic surgeon who is with the Veterans Administration Hospital in Oteen, N. C.

Another member of the committee, Edward T. Blomquist, M.D., was unable to be present at the meeting. Dr. Blomquist is chief of the Tuberculosis Program of the PHS.

Others attending the meeting included William B. Tucker, M.D., of Washington, D. C., chairman of the ATS Committee on Medical Education; Leonard Karel, Ph.D., representing the National Institutes of Health, Bethesda, Md.; and Raymond C. McKay, M.D., representing the NTA Committee on Social Research. Mario Fischer, M.D., NTA president; Daniel E. Jenkins, M.D., ATS president; H. McLeod Riggins, M.D., NTA president-elect; and Walsh McDermott, M.D., editor of THE AMERICAN REVIEW OF TUBERCULOSIS AND PULMONARY DISEASES, attended part of the meeting as interested observers. The ATS staff was represented by Floyd M. Feldmann, M.D., director of medical research; Julius L. Wilson, M.D., director of medical education; Frank Webster, ATS executive secretary; and Mrs. Sylvia Jochnau, medical research secretary.—A.S.F.

HOW AIRBORNE CONTAGION IS SPREAD

Experiments at VA hospitals based on the droplet nuclei hypothesis of airborne contagion are pointing the way to better control of respiratory disease infection



HISTORICALLY, the possibility of controlling airborne contagion has been marked by promising ideas and subsequent disappointments, yet each development has contributed more precise insight into the mechanism of aerial transmission. I shall attempt to place in historical perspective some recent experiments which test a promising hypothesis and point toward eventual success in controlling airborne contagion.

Long before the germs responsible for infection were recognized, health was believed to be adversely affected by miasms, or bad air. In 1860, when Pasteur presented his famous "Memoir on the Organized Corpuscles that Exist in the Atmosphere," people were psychologically prepared to believe that their previous ideas about miasms had now been given a scientific basis. Possibly on this account, they at first attributed much too much importance to miscellaneous airborne organisms. As time went on, it became apparent that germs isolated from outdoor air were not responsible for respiratory contagion in humans, that specific organisms derived from a sick person were required, and that the spread of respiratory contagion occurred only when there was close proximity indoors between the sick and the well. The conditions for effective contact were thus much more circumscribed than was imagined in the enthusiasm of the early years of the era of bacteriology.

In 1899, Flügge offered an important new hypothesis, denying the importance of dust-borne organisms and implicating droplets expelled by a sick person in coughing or sneezing. Flügge's hypothesis satisfied the epidemiological requirement of proximity in time and space between host and victim, and it became the accepted concept of the means of transmission of respiratory contagion.

By Richard L. Riley, M.D.

In 1899, however, there was little understanding of the transformations occurring in droplets after atomization into the air. For this reason, Flügge was led to the erroneous belief that the hazard of infection extends only about a meter in front of a coughing patient. Subsequent experience has shown that preventive measures based on this belief are ineffective.

A new conceptual scheme was proposed by William F. Wells in 1934, in an article entitled "Droplets and Droplet Nuclei." Wells drew attention to the fact that most droplets, which are very small, evaporate almost instantly in the air, while larger droplets fall to the floor and become incorporated in dust. The tiny dried residues of evaporated droplets, which Wells called droplet nuclei, were found to

behave more like a gas than a droplet. Their tendency to settle out of the air was negligible, and they dispersed throughout the air of a room like smoke. Droplets were thus pictured as but a fleeting phase in the production of truly airborne droplet nuclei. Organisms contained in droplet nuclei lived for hours, and subsequent studies demonstrated that they reached lung tissue when inhaled. Wells therefore proposed the revolutionary hypothesis that droplet nuclei were of predominant importance in the transmission of respiratory contagion. (See chart on previous page.)

James B. Conant, in his "Harvard Case Histories in Experimental Science," remarks: "Looking back at the history of any branch of science we can see that a new conceptual scheme (theory) comes to be accepted because it is at least as satisfactory as the older one in relating all the known facts in a simple way and because it proves to be more fruitful of new experiments." Among the many new experiments stimulated by Wells's droplet nucleus hypothesis are three concerning which reports were read this spring. They grew out of two obvious questions raised by the new conceptual scheme: (1) if droplet nuclei are responsible for the transmission of pulmonary tuberculosis, they should be demonstrable in the air of a tuberculosis ward; and (2) if droplet nuclei are responsible for the transmission of influenza and the various respiratory contagions of childhood, the spread of these diseases within a hospital should be controllable by disinfection of ward air.

The attempt to demonstrate tubercle bacilli in the air of a tuberculosis ward was made at the Veterans Administration Hospital in Baltimore, through a cooperative undertaking of the VA, the Johns Hopkins School of Hygiene and Public Health, and the Maryland Tuberculosis Association. A large guinea pig colony was exposed continuously to ward air under conditions which precluded infection by any means other than airborne droplet nuclei. Seventy-one animals were infected over a two-year period, thus proving beyond reasonable doubt that tubercle bacilli riding on droplet nuclei were indeed present, as predicted.

> The story of public health is never finished. Diseases may be overcome; early death and crippling disabilities may recede into the background. But in the fuller life which this helps to create, or of which it is part, problems remain, new ones will arise. Health is a dynamic function which has to be maintained against the continual pressure of powerful forces—biological, economic, social and psychological. The greater our success, the more urgently shall we require vigilance, critical assessment and organization.—C. FRASER BROCKINGTON. *A Short History of Public Health.* J. and A. Churchill, Ltd., 1956.

Ross L. McLean, M.D., reported on "The Effect of Ultraviolet Radiation upon the Transmission of Epidemic Influenza in Longterm Hospital Patients." His study constituted an indirect test of the droplet nucleus hypothesis, since ultraviolet radiation of the air interrupts transmission of infection by droplet nuclei but not by more direct forms of contact. The study was carried out at the Veterans Administration Hospital in Livermore, California, where one of the buildings is equipped throughout with ultraviolet fixtures. The patients who occupied the radiated building remained remarkably free of influenza throughout the epidemic period, although in the nonradiated buildings, patients and hospital staff alike suffered the usual incidence.

The third paper was the presidential address, by Joseph T. Stokes, Jr., M.D., before the American Pediatric Society. Under the title "The Coming of Age of Airborne Infection," Dr. Stokes discussed his own experiments and others with which he was associated, in which various techniques of air disinfection were used on hospital wards. His cumulative evidence implicated droplet nuclei as the vehicle by which respiratory contagion is usually transmitted.

I have mentioned only three current papers which dealt with the hygienic aspects of airborne contagion. Many other investigators, such as Max B. Lurie, M.D., Gardner Middlebrook, M.D., and the group concerned with biological warfare, recognize the importance of droplet nuclei in laboratory experimentation and make valuable use of the extraordinary ability of these particles to infect when breathed.

The droplet nucleus hypothesis appears to be at least as satisfactory as the droplet hypothesis in relating all the known facts in a simple way, and it has proved fruitful of important new experiments. But in testing the droplet nucleus hypothesis, another important principle has been demonstrated: the transmission of infection can be controlled only by the application of very precise knowledge of the mechanism of transmission.

History has shown that it was not enough to recognize the importance of droplets expelled by a patient; control, even under the relatively simple conditions of a hospital ward, had to await the deeper insight provided by the droplet nucleus hypothesis. In the cases of water-borne, food-borne, and insect-borne diseases, successful community-wide control followed upon precise knowledge of mechanisms of transmission. The concept of specific organisms riding indoor air currents on tiny droplet nuclei may well lead in time to the control of epidemic respiratory contagion.

Dr. Riley is associate professor of environmental medicine and of medicine at The Johns Hopkins Hospital, Baltimore. He was formerly associate in medicine at Columbia University, New York City, and assistant professor of industrial medicine at New York University. He is a graduate of Harvard University and received his medical degree from Harvard Medical School. Dr. Riley's article was solicited by the Committee on Medical Public Relations of the American Trudeau Society.

BULLETIN BRIEFS

Health education in the hospital. The Greater Hartford (Conn.) Tuberculosis and Public Health Society, acting for 10 other health agencies as well as for itself, has been carrying on a two-year campaign to supply health information pamphlets through magazine racks in the lobbies of the city's four hospitals. In the largest hospital, the rack is emptied in three days; in the others, the racks have to be refilled once or twice a month. No waste has been observed: visitors take single copies and carry them home. Fastest moving are pamphlets on diet, weight control, baby care, heart diseases, and arthritis. Other pamphlets move more slowly but steadily.

TB fellowship. A fellowship to enable a qualified physician outside the United States to come to this country for formal postgraduate training in tuberculosis and other pulmonary diseases has been established by the Potts Memorial Institute, Hudson, N.Y. The term of the fellowship will be for one year, but may be extended under special circumstances. The Institute is cooperating with the International Union Against Tuberculosis in offering the fellowship, and applications are being handled by the Union.

New homemaker service pamphlet. The need for homemaker service, its nature, and its administration are described in a new pamphlet published by the Department of Public Health Nursing of the National League for Nursing. Single copies are available free from the DPHN of the NLN, 10 Columbus Circle, New York 19. For quantity orders, write to the above address for prices.

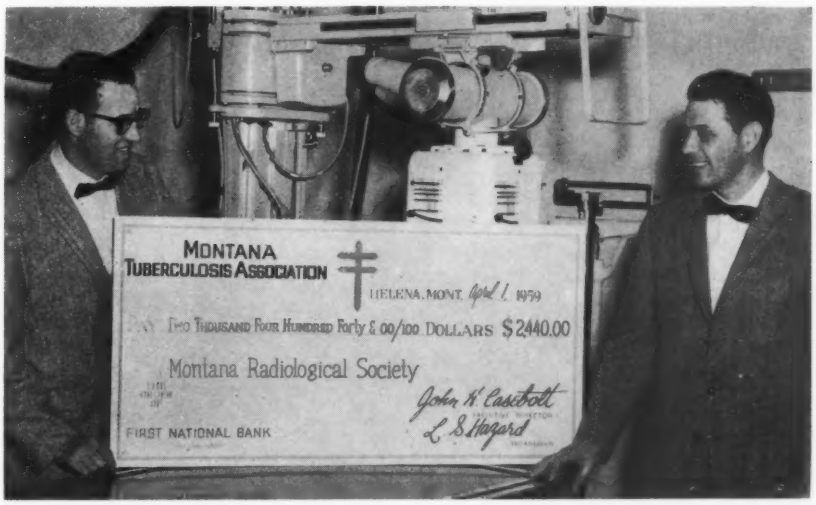
School nursing demonstration. A searching look at its program by the board of directors of the Hardin County (Ohio) Tuberculosis Association last year revealed outdated activities and a need for new ones based on current community needs. The result: a demonstration program to help supply nurses for the county's schools. Schools contributed funds according to student population; the TB association matched them with Seal Sale money. Although the funds were offered on a two-year demonstration basis, so many unsuspected defects and ailments were detected among the students that school officials have now agreed to absorb all the costs of the program and even to expand it.

New guides for board members. A booklet and a filmstrip recently prepared by the National Tuberculosis Association can help board members and other volunteers gain a broader understanding of the principles on which voluntary tuberculosis control programs are based. Copies of the 30-page booklet—"Board Members Against TB"—may be obtained, or showings of the 18½-minute filmstrip —"Approved Principles for Tuberculosis Association Programs"—may be arranged, through any local or state tuberculosis association.

Joint research program. Three groups in Illinois have combined their programs of financial support of medical research by investigators in the state. Charles K. Petter, M.D., president of the Illinois Tuberculosis Association, has announced that funds of the Illinois Tuberculosis Association Research Fund and of the Tuberculosis Institute of Chicago and Cook County, and assets of the Edward Sanatorium, in Naperville, Ill., will provide more than $70,000 annually for grants to Illinois scientists for research in TB.

Public health fellowships. The U. S. Public Health Service and schools of public health are now accepting applications for fellowships for the academic year 1959-60. Final action on applications will not be taken until funds have been appropriated, probably in July. The fellowships are available to health personnel who have finished their professional training, such as physicians, nurses, nutritionists, medical social workers, and health educators. Applications (Form PHS-2629) are available at regional offices of the PHS and at schools of public health.

TB team sent to Vietnam. The first cooperative project in international medicine between a U.S. Government agency and Medico, a nonprofit organization of private physicians, got under way in March when three chest surgeons, two anesthetists, and two nurses volunteered to go to Vietnam to demonstrate up-to-date methods of tuberculosis treatment at a hospital in Saigon. The project had been urgently requested by the Government of Vietnam.



Aid to medical education. The Montana Tuberculosis Association has donated $2,440 to the Montana Radiological Society professional education fund, to provide speakers and programs on radiology and X-rays for local and state medical meetings. The gift is an expression of appreciation for the chest X-rays read without charge by the radiological society of medically indigent patients in connection with the association's case-finding programs during the previous six months.

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People

Mrs. Pauline Matthis, who has been an associate in the Program Development Division of the National Tuberculosis Association since 1953, has been appointed associate executive of the Indiana Tuberculosis Association, effective July 1. Mrs. Matthis was formerly director of program development for the Colorado Tuberculosis Association and executive director of the Boulder-Larimer (Colo.) Health and Tuberculosis Association.

Lloyd Florio, M.D., will resign as Colorado's director-at-large on the Board of Directors of the National Tuberculosis Association on June 15, when he leaves his position of manager of the Denver Department of Health and Hospitals to become chief of the Public Health Division of the U. S. Operations Missions to the Philippines. Dr. Florio is a member of the board and past president of the Colorado Tuberculosis Association.

After 33 years of service, **Miss Ruth Mead,** secretary in the editorial unit of the Division of Education and Public Relations of the National Tuberculosis Association, retired on April 30. Miss Mead first joined the NTA in August, 1926.

Colonel Inez Haynes, who has been chief of the Army Nurse Corps for the past four years, has been appointed general director of the National League for Nursing effective September 1. Colonel Haynes will succeed **Miss Anna Fillmore,** who will become executive director of the Visiting Nurse Service of New York on June 1.

Mrs. Townie Finlayson, formerly Seal Sale director of the Oahu (Hawaii) Tuberculosis and Health Association, has been appointed managing director of the new Bexar County (San Antonio, Tex.) Tuberculosis Association.

Ralph E. Lewis, formerly a health educator with the Saginaw (Mich.) Health Department, has been named senior health educator for the Michigan Tuberculosis Association.

Mrs. Marie Bailey has been appointed executive secretary of the Harford County (Md.) Tuberculosis and Health Association. She had formerly served as a volunteer worker for the association.

Miss Claire Carroll has been promoted from public relations assistant to assistant director of public relations for the New York Tuberculosis and Health Association.

A reorganization of the Minnesota Tuberculosis and Health Association, which divides it into five major divisions, each with a director, has led to the following appointments: **Edward A. Ahern,** formerly chief accountant for the State Department of Education, is business director. **Mrs. Dorothy Ann Berg,** who also acts as executive secretary of the Minnesota Association for Health, Physical Education, Recreation, and Safety, is director of health education. **Mrs. Geraldyn Vessels,** who has had a varied background in radio, television, and newspaper work, is director of public relations, as well as legislative representative. **Thomas F. Mulrooney,** formerly public relations and rehabilitation coordinator, is program director. **Donald M. Kuhn,** who was formerly Seal Sale director of the Dade County (Miami, Fla.) Tuberculosis Association, will assume direction of the Seal Sale.

The Tuberculosis Institute of Chicago and Cook County has appointed three new staff members: **Mrs. Irene Brzezinski** has joined the Health Education Department following a period of field training at the Institute. **Harlan Stricklett,** formerly administrator of the Pennington County (S.D.) Health Department, has been appointed a supervisor in the Health Education Department. **Miss Mary Pokorny, R.N.,** a former member of the Institute's staff and most recently a public health nurse with the Alaska Health Department, has been named administrator of nursing.

Gladys L. Hobby, Ph.D., who has been associated with the Research Division of Chas. Pfizer & Co., Inc., since 1944, has been appointed project director of a special microbiologic research laboratory being established under the Research Division of the Veterans Administration in East Orange, N. J. For the past two years, Dr. Hobby has been a member of the Committee on Medical Research of the American Trudeau Society.

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